

Pacific Packet Radio Society Newsletter

May 1989

PPRS Meeting Announcement:

PPRS meets the first Tuesday of the month at the Ampex Cafeteria located at 411 Broadway, Redwood City. The May meeting is on the 2nd and the speaker will be Steve Roberts, N4RVE. Steve is the author of "Computing Across America" wherein he describes his adventures on his high-tech recumbent bike. He also has written a series of articles on his experiences which have appeared in 73 Magazine. Steve will discuss his work on his latest generation high-tech bike and how he plans to utilize packet radio in that environment. There might be door prizes so come early and get a good seat, and participate in the enlightening discussion. Leadership: Glenn, AA6ER, President, Dewayne, WA8DZP, Vice President, Bill, WA6FSP, Treasurer, Chris, N6RAL, Secretary.

Last Meeting: Microwave Packet:

From: WA8DZP

The speaker at the April meeting was Glenn Elmore, N6GN. Glenn discussed his ideas on the use of microwave technology as a vehicle for high-speed amateur packet communications. Glenn started by outlining the constraints that we face in the portions of the spectrum which we now occupy. This was followed by a rather technical discussion on the advantages which would be obtained by moving high-speed packet activity to the amateur microwave band. After the talk, Glenn demonstrated some of his homebrew microwave equipment and a test 1MB high-speed data link. The talk was rather well attended with an estimated 40 people present.

TI Silent 700 Manual needed:

From: N2AIG @ WA2UMX

I need manual or info on the TI Silent 700 Model 733 ASR Terminal. Reply to N2AIG at WA2UMX BBS. Thanks

MacNet Netletter #20:

From: KB1HE@WB1DSW

KD5VU Mac Tip - Sending Packet Msg in Transparent Mode

The following are the steps to send packets to a pbbs in the transparent mode: (RR10.3 stuff, but will work in 9.4 with minor adjustments)

1. Start with a clean TEXT file (I use MockWrite),
2. On the first line enter the address (SP N5KOB or whatever), RETURN.
3. On the next line enter the subject (Sending PKT Transparent) RETURN.
4. On the third line start entering your TEXT. Edit and do anything you want, but DO NOT hit a RETURN until you have finished entering the text or want a paragraph break.
5. On the last line enter only "/EX",Return.
6. Save the file and go back to Red Ryder.
7. Call up your local PBBS and when you get the prompt, get the RR cmd: prompt and enter "T", this will put you in the Command mode.
8. Click on the SEND TEXT file and it will dump the file out the serial port. You will not see it on the screen.
9. After the "STA" light on the PK-232 goes out, enter SHIFT BACKSPACE to clear the Transparent mode and then type k to get to the Converse mode.
10. Wait for the PBBS prompt and log off with BYE or whatever.
11. This will only work if you have TXFLOW ON and the Modem Break thing checked under Keyboard Mapping Preferences.
12. Another important thing is to have the wordwrap option under the Red Ryder "TEXT File Transfer Preferences.." set to 79 characters so the format will not be all screwed up on the receiving end. (RR10.3 stuff)
13. It's not as hard as this note makes it out to be. Try it!

73 de Dick, KD5VU @ KB5PM - Austin,Texas >>

SpaceNews originates at KD2BD in Wall Township, NJ, and is available on packet radio bulletin board stations across the North America and around the world on the MTTBS telephone BBS at (201) 494-3649, the Unix USENET News Network and also on WangNet.

SHUTTLE NEWS: ATLANTIS will be rolled out to the launch pad at the Kennedy Space Center, Florida on Wednesday for the next shuttle mission, scheduled for April 28th. The April mission will deploy the "Magellan" Venus probe from the shuttle's cargo bay. There are six more shuttle flights scheduled for this year.

OSCAR-9 NEWS: All four HF beacons on OSCAR-9 have been switched on and are transmitting telemetry in 12 WPM Morse code. The frequencies are 7.002, 14.002, 21.002 and 29.510 MHz. Interesting propagation effects can be noted when monitoring more than one beacon simultaneously.

On Thursdays (UTC), the VHF beacon will transmit telemetry in plain English using its Digitalker. The telemetry channels to be transmitted include:

- 08 : Battery Pack A Temperature (C)
- 09 : Spacecraft +X Facet Temperature (C)
- 17 : Magnetometer Experiment -Hz Fine
- 18 : Battery Pack B Temperature (C)
- 19 : Spacecraft -X Facet Temperature (C)
- 27 : Telecommand Receiver Current (mA)
- 28 : Radiation Experiment Temperature (C)
- 29 : Spacecraft -Y Facet Temperature (C)

The VHF beacon transmits on 145.825 MHz FM with 300 mW of transmitter power. The HF CW/A0 beacons run 100 mW each.

WEBERSAT NEWS: The primary payload aboard WEBERSAT is an experimental low resolution TV module. The module is a collection of experiments designed and built by students from the Center for Aerospace Technology at Weber State College in Ogden, Utah.

The experiments are:

1. A standard miniature CCD color TV camera modified to operate in a vacuum.
2. A spectrometer sensitive from 300 microns to 1100 microns.
3. A 1265 MHz ATV receiver.

The data generated by each of the three experiments are digitized and loaded into the bank-switched 2 Megabyte memory area of the computer. The digitizer sampling rate can be varied from 2.4 KHz to 10 MHz.

The TV Camera Experiment

The TV camera is a Sony Ci-10 product. It produces a standard color NTSC analog waveform which is digitized at a sampling rate of 10 MHz. The CCD element in the camera has a resolution of 780 X 490. It is estimated that when the camera is pointing towards the Earth, pictures will be taken of a ground area about 350 km X 350 km with the lens to be used.

The digitized television frame includes all synchronization signals, color burst and chrominance information. The picture is compressed, archived and stored in the 8 Megabyte area of computer memory. Pictures will be downlinked in compressed form. Software will be made available for the display of these pictures.

The camera will point out of a side of the spacecraft (perpendicular to the Z axis). Given the expected tumble and spin of the satellite, this arrangement provides the maximum view of the Earth. Positioned next to and on either side of the lens are small photocells which will act as horizon crossing sensors. They will be designed for a narrow field of view and will be pointed so that their view fields do not overlap. When both sensors are illuminated at the same time, that side of the spacecraft faces the earth (about 135 degrees wide at that altitude).

The Spectrometer Experiment

The spectrometer experiment is designed to provide the spacecraft with sensing capability to offer substantial educational potential in the field of physics. Spectral reflection from the earth's atmosphere at various latitudes and longitudes is characterized by frequencies of absorption. Spectrometer data can be used to determine atmospheric components within the field of view of the device.

The spectrometer will also point out of a side of the spacecraft at 90 degrees to the TV camera. Two additional horizon sensors will be located on the side of the spacecraft adjacent to the spectrometer. They will be employed to sense the Earth in a manner identical to that described above for the TV camera sensors.

The 1265 MHz ATV Receiver

The 1265 MHz ATV receiver experiment is designed to study the value of store-and-forward capability as it applies to pictures. The 1265 MHz ATV receiver will receive a picture uplinked in the amateur satellite 23 cm band. The picture will be digitized and because the designed experiment is designed for the NTSC TV format, the requirements for storage and handling of the digitized data on the spacecraft are identical to those of the camera.

FEEDBACK WELCOMED: Feedback regarding SpaceNews can be directed to the author (John) via any of the following paths:

UUCP : ucbvax!rutgers!petsd!tsdiag!ka2qhd!kd2bd
PACKET : KD2BD @ NN2Z

SOURCES: Some of the news contained in this SpaceNews issue was obtained via OSCAR-9, OSCAR-11 and the KA2QHD and NN2Z PBBs.
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NEC 8201 2-meter inteference:

From: K4ADL@N4QQ

My portable packet station includes an NEC 8201 Laptop and a 2m handheld with an AEA Hotrod telescoping antenna. The NEC places a very strong carrier on 145.05, making that frequency totally unusable. Has anyone out there experienced this difficulty and found a solution? Please respond to K4ADL @ N4QQ. Tnx & 73, Andy/K4ADL.

TAPR Report: MicroSat Power Module:

From: KE3Z

Jon Bloom, KE3Z, of the ARRL Laboratory, described ARRL Labs contribution to the MicroSat project. He has designed the power module, including the batteries and battery charge regulator. The solar cells are arranged in clips of 20 cells in series, providing about 22 volts when illuminated. The power control system provides 10V unregulated and 5V and 8.5V regulated to the rest of the satellite. The power control system is heavily instrumented with telemetry sensors. A clever circuit based on a saturated toroidal core is used to measure current without dissipating much power.

TAPR Report: MicroSat Chassis:

From: W3GEY

MicroSat program manager Jan King, W3GEY, displayed the MicroSat chassis that was used for vibration tests. It was subjected to 15 G's RMS. He said that all the solar panels (which were once believed to be the critical-path items) had been received from the vendor. Each satellite has two transmitters; it is possible (but not currently intended) to operate both at once. It is yet to be determined whether the two transmitters will be placed on the same frequency or two different ones. The satellite is expected to have a long service life. Its lifetime will probably be limited by radiation damage to the large RAM array. The batteries are 6 Ah GE aviation NiCads, which have functioned flawlessly on UoSAT for over five years. The total materials cost for a MicroSat is approximately \$43,500.

PK 232 Problems:

From: WA2AAR @ WA2AAR

THE INTERNAL UNREGULATED SUPPLY CAUSES PROBLEMS: IF OTHER HIGH POWER EQUIPMENT IS TURNED ON/OFF, THE RESULTANT AC GLITCH CAN CAUSE THE PK-232 TO "LOSE ITS MIND" REQUIRING THAT IT BE TURNED OFF FOR A SHORT WHILE. THEN TURN IT ON AND LET PACKRATT INITIALIZE EVERYTHING. THIS HAPPENS WHEN I INADVERTENTLY TURNED ON/OFF MY IC-735 PLUGGED INTO THE SAME LINE AS THE PK-232 POWER. IT DOESN'T ALWAYS HAVE THIS EFFECT, LEADING ME TO BELIEVE THAT IT DEPENDS WHERE THE AC LINE WAVEFORM HAPPENS TO BE IN ITS CYCLE WHEN THE POWER SWITCH IS USED.

THE 12V REG CAN BE MODIFIED FOR A 13V INPUT OR PLACE TWO 15V ZENER DIODES BACK TO BACK ACROSS IT. I PLACED A 100uf ELECTROLYTIC CAP IN PARALLEL WITH MY SUPPLY WITH GOOD RESULTS. N2HRJ TONY

WA4DSY Modem comments:

From Phil Karn via internet

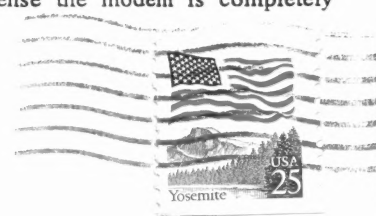
In article <14795@bellcore.bellcore.co> I wrote: "I will be looking at the design of the WA4DSY modem to see if the keyup delays can be improved. I know Dale made the transmitter half-duplex out of fear of QRMing the receiver, but it has been my experience that the halves are well enough isolated even when operating on the same IF that this isn't a problem. Apparently much of the delay is in starting the various crystal oscillators in the transmitter, and these could be run continuously."

I think I may have mislead some people with the term half duplex. What I *meant* was that the WA4DY modem transmit (clock and RF carrier) when the RTS input line is brought inactive. Dale's intent here was to prevent QRM to the receiver (a separate part of the modem) when the two are configured to operate in a half-duplex mode on the same frequency. Fortunately, the physical layout was done so well that this concern seems unwarranted. You can even saw the RF board into TX/RX halves and put the modulator and demodulator into separate shielded boxes if you want, but I haven't found this to be necessary.

The problem I was alluding to was that the keyed transmit oscillators are apparently the major components of the 15-20 ms keyup delay; crystals are very high-Q devices. Some trivial modifications to the modem would allow these oscillators to run continuously, with only the transverter actually being keyed. I will be experimenting with these approaches in the hope of getting the keyup delay down to the 5-10 ms range, which I understand is the acquisition time of the clock recovery loop in the receiver. There are some fundamental tradeoffs between acquisition time and weak-signal performance, so there's a limit to the turnaround speed of *any* modem.

There is nothing inherently half-duplex about the WA4DSY modem design when configured to run on different transmit and receive frequencies. You can easily leave the RTS line to the transmitter up all the time and receive data at the same time. There are NO components that have to be switched between transmit and receive, so in this sense the modem is completely full-duplex. Sorry for any confusion, Phil

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